

Animal Enrichment for Captive Orangutans at Racine Zoological Gardens

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Abstract

Animals taken from their natural habitats by humans are expected to live in zoos with small corridors and the same surroundings for the rest of their lives. To ease this transition in lifestyle, zookeepers have developed a variety of ways to enrich the lives of captive animals. However, there is still much to learn about what enrichments are the most effective. Here, I present a study to examine whether captive orangutans have preference particular types of enrichment. My expectation was that in a choice study, the male orangutan would prefer enrichment that is from his native environment (natural enrichment) compared to enrichment that is man-made (artificial enrichment). Through both types of enrichment did effectively reduce the amount of time spent relaxing, my hypothesis was not supported since the orangutan preferred artificial over natural enrichment. This could be due to lack of previous exposure for an animal born in captive artificial objects are the norm.

Keywords: environmental enrichment, zoos, orangutans

Introduction

Deforestation and poaching are common occurrences in the tropics, with as much as 97% of Bornean forests affected (Orangutan Conservancy, 2007). Many organisms, including orangutans (*Pongo pygmaeus*) are affected by these activities, and as a result, natural populations of these animals are declining. In an effort to maintain populations, individuals of these species are being maintained in zoos. The benefit of this is that the animals survive in some capacity, but raising wild animals in zoos offers its own set of challenges. Captive animals are usually born and raised in zoological gardens and spend their entire lives in the same environment never facing the threats to their lives as wild animals face. Animal care specialists work closely with animals to keep them content and active while in these limited environments.

One way in which animal care specialists improve the lives of animals in captivity is by using enrichment. Environmental enrichment is a concept that describes how the environment of captive animals can be changed for the benefit of the animals (Shephredson, 1994). Therefore giving environmental enrichment gives them a chance to interact with in their exhibits. This approach is especially important for animals that were captivated from the wild, to make their transition smoother. Animals born in zoos, however, never had the opportunity to interact with their natural habitats though animals are expected to show the same instincts as their wild counterparts. On the other hand, zoo-born orangutans may have learned to prefer artificial objects since they have come in contact with so many human objects during their time in captivity. Therefore, this study aims to determine what kinds of objects captive orangutans

prefer in order to choose the most appropriate enrichment objects for the zoo-born orangutans at the Racine Zoological Gardens in Racine, Wisconsin.

Literature Review

Life History of Orangutans

Orangutans are part of the great ape family that includes, gorillas, chimpanzees, and bonobos. Orangutans are found in Asia, on the islands of Borneo (*Pongo abelii*) and Sumatra (*Pongo abelii*), where as gorillas, chimpanzees, and bonobos occupy much of Africa. Orangutans are solitary species but make occasional social contacts (Gibbons, 1994). Orangutans usually spend most of their time alone in natural habitats due to food scarcity. But when food is abundant, orangutans become social with others.

Sharing 97% of human DNA makes orangutans the closest relative to humans (The Orangutan Conservancy). Not only is our DNA shared with these species but our hands are very similar as well. Orangutans have four fingers and a thumb on their hands. In the wild, orangutans can live to be 40 years old, but in captivities their life expectancy is nearly 60 years (Racine Zoological Gardens).

These fascinating creatures are distinguished throughout the wild based on their problem solving skills. The highest form of problem solving involves insight. This is if one has a problem to figure out, it only takes a few moments to suddenly have an idea of how to solve the problem. For example, within their natural habitats in the rainforests, mountain forests, and lowland swamps it is often rainy. During rainstorms, the orangutans will often take a large leaf to cover their heads and bodies (Van Schaik, 2004). Covering their body to prevent wet fur is one example of how these organisms problem solve daily and shows how they have adapted to these climates. Another example of insight problem solving is an experiment by Lethmate. In the 1980s, psychologist Jurgen Lethmate gave a problem to three young male orangutans with the tasks requiring the orangutans to find a sweet within a box. There were five boxes with keys to unlock each one. Some boxes contained another key that would then unlock the box with sweet. Scientist, Lethmate, gave an orangutan a piece of wood used to poke a sweet out of a plastic tube. At first the orangutan became frustrated with the tube and left the area, then returned back to the tube to poke the sweet out of the tube immediately (Kaplan 2000).

Even in their natural habitats, orangutans using problem solving. If something is out of

reach, they will use of a twig or branch to extract the food from a log or to reach inside of a deep hole. Alternatively, they will use the stick or twig to pull a vine closer to them. Orangutans are not the only animals that use tools such as sticks, rocks, or sponges to reach something that is difficult to retrieve. Orangutans use tools to break into objects, even though orangutan's hands are strong and they can break into a termite nests in a branch and feed on the termites without any tools (Van Schaik, 2004).

History of Environmental Enrichment

Primate scientist Robert Yerkes established the concept of enrichment in the 1920's by examining the behavior of primates in his lab and how primates interacted with humans, other primates, and objects used for play (Young, 2003). Heini Hediger, in the 1940s, studied the psychological needs of captive animals at the Zurich Zoo, Switzerland (AAZK, 2007). After these enrichment studies, zoos were encouraged to use enrichment to help animals in captivity. Most zoos in the United States of America currently use environmental enrichment to keep animals content, occupied, and using "natural" behaviors while in captivity (AAZK, 2007). Animal welfare, veterinary medicine, and environmental enrichment are critical components to captive animals (Smithsonian, 2007). For example, with enrichment animals can show their arm for blood drawn instead of being put to sleep, which makes veterinarian visits easier. Enrichment gives an animal new opportunity to play or interact with objects. The zookeepers job is to present the enrichment in new and unique ways for the best interest of the animals. Zoos throughout the world use enrichment but have a variety of methods to enrich the lives of captive animals.

Categories of enrichment

Certified zoos who use enrichment attempt to mimic natural environments, as closely as possible. Enrichments are then added to these environments in a variety of ways. The six most popular enrichment types used in zoos currently include, exhibit design, training, olfactory, auditory, food related, and novel objects. Though it is rare for zoos to use all six of these types of enrichment on a single animal, combinations of two or more are often used to give the animal the best possible environment in captivity.

Exhibit Design

Researching natural habitats and life styles for animals is important for creating the most effective exhibit for each organism. Research of natural habitat with the components of the

animal's environments is important to give the sense of a natural environment. Exhibit designs for an orangutan may include: fire hoses, murals on walls, trees, ponds, ropes, and other objects that mimic the natural environment of the specie. All objects encourage the animal to stay active during their time in captivity. Fire hoses can be used to build hammocks, which act as a nesting area for any animal. These hoses are sturdy enough to hang from the ceiling of the enclosure or off a tree that may be in an exhibit. Orangutans in the wild never use the same nest during different nights; all nests are new and made the day of nesting. Murals on the wall mimic natural environments of the animal. Animals have become used to murals, but can give visitors a sense of what the environments of these animals look like, giving an educational opportunity. Ropes in enclosures act like vines that orangutans and other primates use in environments to get from one tree to the next. Therefore, research is key in creating the design for each exhibit.

Animal Training

An animal care specialist works with all animals to create a trust and bond with the specific animal. Animal training is a source of enrichment, because it gives interaction between animal and humans. "Animal training at the National Zoo is done to monitor animal health, providing essential medical procedures and preventive care without the use of restraint or anesthesia" (Smithsonian, 2007). Not only does animal training help with interactions and veterinarian visits but gives the animal physical exercise as well as mental challenges for the animal to work with. Examples of animal training results with orangutans presenting a body part for examination, retrieve and trade items with the keeper, and daily shifting routine.

Music

Playing tapes in exhibits is a common enrichment for animals in which display sounds from natural habitats. Some sounds that can be heard could be the following: water rushing, wind blowing, mating calls, or birds singing. These sounds will stimulate the animals to what they would hear in their natural environments. When playing a tape with mating calls, careful observations must be taken of the animal and continuous calls played in an exhibit only when animals do not show stress. Animals can show stress to these sounds if they have recently lost a companion or if there are no mates around. However, sounds can also reduce stress. In a lab study, scientists found that playing human voices reduced the aggression of primates. This likely was due to the fact that before the experiment, when there was aggression between primates, the

scientists would separate the primates to reduce fighting (Young, 2003). This describes how music can have a positive effect on captive animals.

Food

Most animals spend their time foraging in natural environments, but in captivity, they do not have that much space to forage for food. Therefore, the keeper's job is to find ways to help the animal stay busy trying to find food and giving them something to do during the day. Keepers have come up with different ways to present food to animals including "simple puzzle feeders, hidden throughout the enclosure, scattered about the enclosure, or buried in a substrate" (Smithsonian). Puzzle feeders provide primates with a challenging way to receive their food. These puzzles are set to encourage animals to forage for food. Foraging for food is a natural behavior for all primates, but for the animals to practice foraging is a good exercise using both physical and mental strength for the animal. Not only do these puzzles encourage the primates to forage for food, but encourages them to mentally solve the puzzle. The puzzle feeder mimics ways of getting their food in natural habitats. It can take much time for the primates to finally get the food out of the puzzles, but primates use their entire days to forage for food. Scattering food around the enclosure is a common way to feed animals. Scattering the food instead of placing the food in one location, gives the animal a way to search for the food but at the same time it also helps the animal stay active throughout the day, encourages the animal to move around the exhibit gives exercise to the animal which causes them to forage instead of sit in one spot eating food.

Puzzle feeders have been found as an effective enrichment for orangutans (Cook 1989). Within this experiment, Cook gave an orangutan a puzzle feeder, which causes the orangutan to problem solve different ways to get the food from the object. The puzzle feeders have finger holes, which are large enough for an orangutan's finger to push the food through a design to make the food fall out of the bottom hole, and then the orangutan can enjoy the food after foraging in a different way.

Novel Objects

Novel objects are included in most animals' enclosures to encourage the animals and challenge the animals to mimic behaviors from the wild. Novel objects include burlap bags, sheets, boomer, balls, chew toys, hammocks, newspaper, and ropes. In many cases, novel objects will be combined with food enrichment. Orangutans, for example, will have a water

bottle with juice inside and the orangutan has to problem solved to get to the juice inside the bottle. The novel objects will not be found in the natural environment but in captivity it keeps the animals content and interested in problem solving and interaction with objects.

Though the general categories of enrichment are the same for all orangutans, specific enrichments can be designed for different species and different individuals. Most zoos have different strategies on how to give out enrichment for their animals. For example, since primates are very tactile creatures, enrichments can be designed that encourage them to use their hands and feet. Gorillas and orangutans both use the enrichment designed just for non-human primates including treat tubes, browsing, hay, and foraging specifically designed for primates (Nelson, 2005). Treat tubes are made for primates, because these animals use their hands and feet to help them get retrieve the food from the tubes. This type of enrichment uses two categories of the environmental enrichment including; food related as well as novel objects. For example, treat tubes are filled with various liquid foods such as oatmeal, peanut butter, honey, or mustard (Smithsonian). These tubes, give the orangutans or other primates a special treat that would not necessarily be found in their natural habitats, but help the primates forage for food by using other objects to get the treats out of the tubes. With these objects, the non-human primates will strip and eat the bark or even the woody parts of the branches. In natural environments the orangutans use branches in their daily routines of life including; using a leafy branch as a swatter to ward off angry bees, or using a leafy branch to scoop water from deep tree holes, which is out the orangutan's reach (Schaik, 2004). The final type of primate environmental enrichment is browsing, which encourages primates to use their natural behaviors in captivity, is through the use of sticks. Many exhibits will also have hay distributed throughout the enclosure, to provide the animals nesting objects or to hide food so that the animals must forage for their food.

Case Studies

Brookfield Zoo

The Brookfield Zoo was established in 1919, Edith Rockefeller McCormick donated 83 acres of land and the forest District of Cook County donated additional 200 acres of land for the formation of the Brookfield zoo in Cook County, Illinois. Opening in 1934, the zoo quickly gained international attention. First it is a "barless" zoo, designed with exhibits that have moats or natural barriers. The mission is to inspire conservation leadership by connecting people with

wildlife and nature. The community of the Brookfield zoo has the vision to be the preeminent zoological institution working with people to achieve a more harmonious and sustainable relationship with nature.

The Brookfield zoo takes steps to give captive animals a safe environment by “researching each animal’s natural history to determine their behavior needs. Once there is an understanding how an animal normally interacts with its environment we then develop ways to provide similar opportunities here at the zoo (Brookfield Zoo).” Research is crucial when it comes to captive animals and their life styles. “The practice of environmental enrichment includes innovative and ingenious devices and techniques that provide each animal with behavioral ‘opportunities’ to occupy their waking hours (Brookfield Zoo).”

The Brookfield zoo houses nine orangutans, adult males and females as well as adolescent orangutans. With these orangutans the arboreal behavior has been studied at the Brookfield zoo, focusing on how orangutans use locomotion. They built a hammock in the holding area behind their exhibit to the public. This study was used to present a new type of enrichment to present locomotion and foraging challenges as well as to properly use the limited space in the holding areas. Another study at the Brookfield zoo says that enrichment for an orangutan should meet the following goals including increasing the animals’ foraging time, increasing activity levels, and keeping enrichment items novel to give the animals a choice whenever possible.

Racine Zoo

Jacob Stoffel donated three monkeys during the year of 1923 to establish a zoo at Island Park in Racine Wisconsin. Within the first year of the zoo housed monkeys, two deer, two badgers, two gray foxes, and several Rocky Mountain Goats. Throughout time many animals were added. From 1936-1939 the Vanishing Kingdom was built, which is the main building of the zoo, housing large cats, primates, and tropical animals. Currently the zoo houses 250 animals on 32 acres of land along Lake Michigan. The Racine Zoo mission is to foster an enlightening and affordable wildlife experience that improves the bond between people and nature.

The Vanishing Kingdom houses the orangutans in an enclosure that approximately 16,938 square feet with the shape of an octagon cut in half with slanted ceilings. This exhibit houses two orangutans: Jenny, who is 22 years old, and her half brother Max, who is 21 years

old. Within the main enclosure, there are components to make the exhibit including fake trees, ropes resembling vines, mural of a rainforest, and water in a pool. Within their enclosure there are different kinds of novel objects including; hay, egg crate, blue plastic barrel with handles, tan stool, newspaper, cardboard, hammocks, large ball, towels, and natural light as well as electric lights. All novel objects are placed throughout the exhibit giving Max and Jenny the option of what type of enrichment they prefer to interact with. Different enrichment is given to the orangutans everyday, giving them different choices, an important part of environmental enrichment. The exhibit is enclosed with glass, which allows the orangutans to interact with visitors that may come to visit from day to day.

Developing New Options for Enrichment at the Racine Zoo

Many types of environmental enrichment that can be used for different animals in captivity have been developed. The environmental enrichment is used to strengthen the time the animal spends in captivity as well as reinforce natural behaviors. For my experiment, I have will use Max as my object of study with natural and artificial enrichment given to him. He will be used for observation hours because he interacts with enrichment more then his sister Jenny. Also, with the short amount of time being spent observing, it will be easier to collect and understand collections.

If orangutans spend most of their day in the wild foraging for food, then would the circumstances be the same for a captive orangutan, who cannot forage through large and different areas? I hypothesis that Max will choose something that is not usually found in his exhibit all the time, because based on previous observations, Max is curious about different objects found in his exhibit. He is interested in new objects compared to objects usually in his exhibit. Therefore, giving him the choice between to types of enrichment will give him an option.

Methods

Data for this study was collected between October and December 2007. An instantaneous sampling table as well as an ethogram (Appendix 1) was used to document approximately 18 behaviors before giving Max additional enrichment. All behaviors were documented every 15 seconds for 60 minutes at a time. With a one hour time period, a total of

240 observations were recorded. Each behavior was defined as part of one of six larger categories behavior, including locomotion, feeding, enrichment, relaxing, specific enrichment, and interaction.

Choice Study Experiment

A choice study was performed with the 22-year-old male orangutan (Max), *Pongo pygmaeus*, at the Racine Zoological Gardens. For this experiment, I compared Max's response to the introduction of natural and artificial objects. The natural enrichment used for this experiment was Sugar maple, *Acer saccharum*, leaves, which were found on the grounds of the Racine Zoological Gardens, which are not native to Max's natural habitat, but its an item that is natural to an environment. The other type of enrichment given to Max was shredded newspaper; this type of enrichment represents artificial objects. Within both types of enrichment, was placed part of Max's diet.

Max was observed for a total of six hours. Three hours were spent before specific enrichment (natural or artificial) to establish a baseline and three hours while specific enrichment (natural or artificial) was given. Each observation period lasted one hour, with 240 observations within that hour. I hypothesize that Max will choose the natural enrichment over the artificial enrichment, because its something that is not usually in his exhibit year round. Therefore, Max will be attracted to the pile of leaves instead of shredded newspapers.

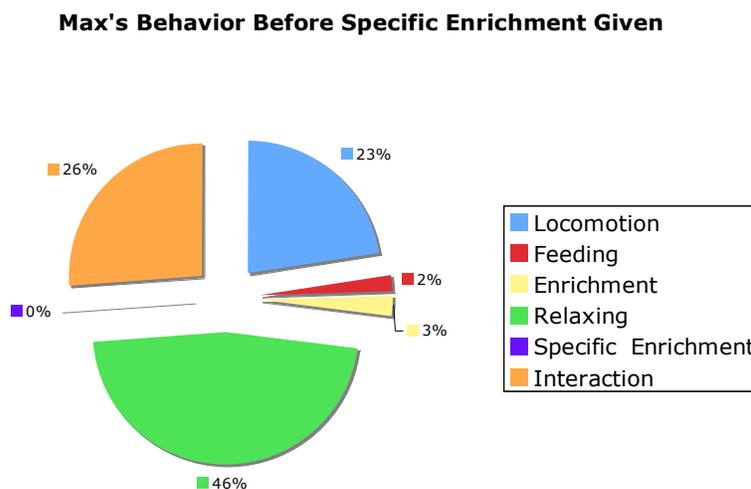
The specific enrichment that was added to Max's exhibit included a pile of maple leaves (natural pile) as well as a pile of shredded newspaper (artificial pile). Within each pile part of Max's diet can be found. Each pile is either artificial or natural, which gives Max the option as to which pile he prefers to forage for food. The piles were separated, one on either side of the exhibit.

Results

As a result of specific enrichment added to the Orangutan exhibit, Max interacting with the enrichment, which caused him to be more active within his exhibit, instead of resting within his environment. Max's locomotion was similar during both sections of observations, where both times he spent a quarter of the time moving in his enclosure. Before specific enrichment was given Max spent a majority of his time relaxing and another quarter interacting with the

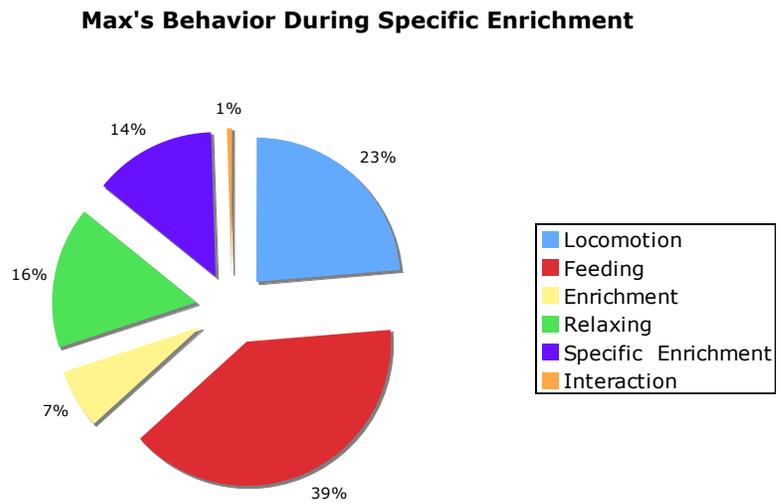
zookeepers or his sister. But when specific enrichment was given, Max would be found eating. His time relaxing was halved with more time spent moving from enrichment to another enrichment.

Figure 1. Max's behavior before specific enrichment given in exhibit.
Locomotion included movement around the exhibit by walking, swinging, or spinning. Feeding is when Max is eating from his diet or food found within enrichment. Enrichment includes time spent with items found in the enclosure, including balls, plastic jugs, barrels, or hay. Relaxing includes lying down or sitting. Specific Enrichment is the enrichment used for choice study (newspaper or leaves). Interaction includes interaction with the zookeepers or the other orangutan.



This graph shows the percent of times Max showed each behavior. Within these three hours of observations, Max spent more time relaxing than interacting with enrichment. These hours were the baseline for the experiment, before any specific enrichment was given.

Figure 2. Max's Behavior During Specific Enrichment Given



Locomotion, feeding, enrichment all increased during specific enrichment time while time relaxing decreased drastically as well as interaction with others. As the graph shows here, Max was active and interacting with objects within his enclosure.

Figure 3. Before vs. During Specific Enrichment given, compares the two observation sections. Showing the contrast between before and during specific enrichment time.

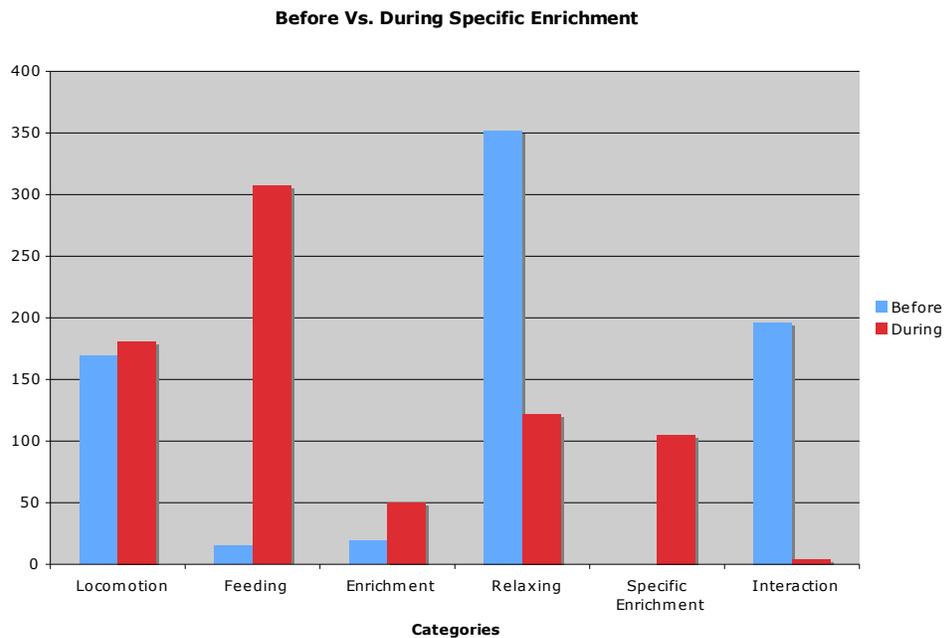


Figure 3 shows the difference and similarities of behaviors Max had during all observation times. The x-axis shows the categories of behaviors where as the y-axis is the amount of times Max showed the specific behavior. When specific enrichment was given, Max spent a large majority of his time interacting with the enrichment then he did before specific enrichment was given.

Figure 4. Visits with specific enrichment.

This shows the amount of time Max spent with the individual enrichment.

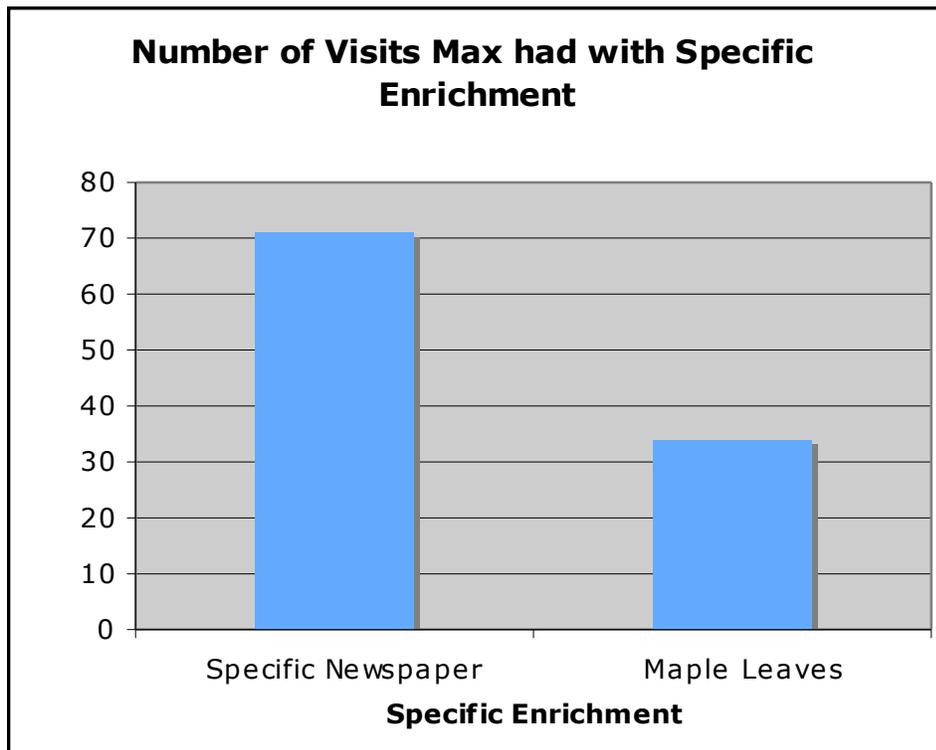


Figure 4 takes the two specific enrichments and measures the number of visits Max had with each. Max made more visits to the specific newspaper (artificial enrichment) rather than the maple leaves (natural enrichment).

Appendix 1. Ethogram giving definitions of all behaviors observed during observation hours. Attached at end of thesis.

Discussion

As seen in the results, different enrichment is important for captive orangutans. It helps the animal stay occupied and causes them to become curious in different objects found in their enclosure. The results showed that feeding increased when given specific enrichment; this is due to Max foraging for the food that was within each pile of specific enrichment. Also, interaction decreased during specific enrichment. In part, this was because the zookeepers were not present during specific enrichment observations, but his interaction with his sister decreased during specific enrichment given. Suggesting that when given specific enrichment with food he was interested in enjoying the “better” food before his sister had a chance to forage for the food.

Importance of Enrichment

Without enrichment, captive animals would be enclosed in an exhibit that would resemble a box giving the animal no sense of a home. Building the enclosure is the first way enrichment comes into view, with creating the enclosure to best suit the individual or group of animals. Then everything within the enclosure keeps the animal occupied. An enrichment item can be anything natural to artificial (man-made). Enrichment is important, because not only does it give the animal something to interact with, but encourages the animal to forage throughout the exhibit for food. Moving throughout the exhibit gives the animal an opportunity to use locomotion and get exercise.

Future Study

Follow up studies to do with Max in the long term is to study what causes Max to interact with the enrichment he does. Does he actually pick enrichment due to the fact that it is natural or artificial? Or does it even matter to him? For this study to work and for the observer to understand what Max is thinking, a psychologist who studies the behaviors of orangutans would need to be present. Not having background in the psychology of orangutans would be difficult to document why they are doing something. For the study, having two piles of enrichment, one artificial and natural, placing the same piles in the same location within the exhibit, but then overtime changing the location of the enrichment within the exhibit. When the enrichment is in the same place, does Max always go to a particular pile of enrichment? Or when the location of the enrichment is changed to a different part of the exhibit, does Max change which enrichment he goes to first? Does he notice a difference in his exhibit design when he comes into the exhibit? Does it matter to Max if the pile is artificial or natural?

Another study to be conducted with Max is to use a puzzle feeder. Max is intelligent

when it comes to figure out how something works. Many times Max's food is placed within a plastic jug, which forces Max to figure out how to retrieve the food. Therefore, giving Max a puzzle feeder on a larger scale, would encourage him to problem solve how to receive the food. In the wild many orangutans use sticks to maneuver food out of trees or holes. Giving Max a stick or pipe with a log or large PC pipe with food on the inside would cause Max to figure out how to get part of his diet. With this experiment I would study him over a long period of time, every time observing how long it took him to receive the food out of the PC pipe. I would want to know how long it took Max to recognize the PC pipe had food inside of it? Does Max continually attempt to receive the food or does he gives up and come back to the pipe? After many observations does he become quicker with receiving the food?

Conclusion

If the Racine zoo gives orangutans environmental enrichment to occupy their lives in captivity, the objects could be artificial or natural enrichment. Either way the orangutans will interact with them, but with the results found more time was spent with the artificial enrichment. Therefore, artificial enrichment works as affectively as the natural enrichment with these animals. Enriching the lives of captive animals is important to their well-being. Just like humans these animals need new items in their environments even if the items are artificial and not natural. Therefore, environmental enrichment impacts the lives of captive animals.

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Appendix 1. Ethogram including definitions of behaviors and categories of each behavior.

Relaxing: Max is laying down on the rock in rear area of the exhibit, which gives him the opportunity to relax from locomotion and eating

Closed Eyes: Max has his eyes closed, Max is extremely relaxed and not bothered by anything.

Eating: Eating part of his diet, filling his stomach

Chewing Hay: Found hay and is chewing on it, interacting with his enrichment

Watching: Max is watching the guests while on a rope, interacting with humans

Pushing: Max is pushing his enrichment throughout the exhibit,?

Carrying Blue: There is a large Blue Barrel in which Max has in his hand or foot and is carrying it throughout the exhibit while he is walking or swinging on ropes

Upside-Down: Max is hanging upside down from a rope or by the wires on the door

Sitting/Watch: Max is next to the glass sitting on the rocks next to the glass watching the visitors who are visiting him

Swing Front: Sitting on a rope facing the glass, which allows Max to watch visitors who maybe watching him.

Swing Back: Sitting on a rope with back towards glass, Max is now ignoring guests

Chilling Rope: Hanging out on the rope, sitting up, but not swinging

Sitting Corner: Max is sitting in the far left hand corner of his exhibit

White Enrich: Max is interacting with the white enrichment

Tennis Ball: Max is playing the with white tennis ball

Spinning: Max is hanging onto a rope with one hand and spinning in a spiral

Swing Exhibit: Max is swinging around his exhibit

Drinking: Max is drinking from the artificial pond

Sitting/Door: Sitting at the door where the animal care specialists can talk and interact with Max

Newspaper: Interacting with the newspaper

Sitting Rock: Max is sitting on the rock in the middle of the exhibit next to the little pool of water. Sitting on the Rock gives Max an opportunity to take a break from moving around the exhibit.

Lying on Stomach: Max is laying on his stomach on the rock in the middle of the exhibit next to the little pool of water. Lying on stomach, gives Max a comfortable position, which allows him to relax more comfortably.

Hick Ups: Max has the hick ups which is forcing air into his lungs

Combo of Enrichment: Max has placed all of his enrichment into one big pile, but has done so by creating a pattern or which enrichment will fit best inside the next, which makes it easier for him to pus all the enrichment to one area and not having to make trips back and forth.

Scratching Head: Max has used one of his hands to scratch his head to reach an itch that he has.

Yawning: Max is yawning, which is a sign that he is tired

Play Jenny: Playing with Jenny...Interaction with another orangutan

Walking: Walking on two legs

Maple Leaves: Pile of Maple leaves used for Choice Study to test which pile natural vs. artificial does Max prefer in enrichment.

Shredded Newspaper: Pile of shredded newspaper used for Choice Study to test which pile natural vs. artificial does Max prefer in enrichment.

Individual Categories for Behaviors

Locomotion

Upside-Down: Max is hanging upside down from a rope or by the wires on the door

Swing Front: Sitting on a rope facing the glass

Swing Back: Sitting on a rope with back towards glass

Spinning: Max is hanging onto a rope with one hand and spinning in a spiral

Swing Exhibit: Max is swinging around his exhibit

Walking: Walking on two legs

Hanging Door: using different body parts (legs or arms) to hold body in place while hanging from door.

Feeding

Drinking: Max is drinking from the artificial pond

Enrichment

Pushing: Max is pushing his enrichment throughout the exhibit

Carrying Blue: There is a large Blue Barrel in which Max has in his hand or foot and is carrying it throughout the exhibit while he is walking or swinging on ropes

White Enrich: Max is interacting with the white enrichment

Tennis Ball: Max is playing the with white tennis ball

Newspaper: Interacting with the newspaper

Combo of Enrichment: Max has placed all of his enrichment into one big pile, but has done so by creating a pattern or which enrichment will fit best inside the next, which makes it easier for him to pus all the enrichment to one area and not having to make trips back and forth.

Specific Enrichment

Maple Leaves: Pile of Maple leaves used for Choice Study to test which pile natural vs. artificial does Max prefer in enrichment.

Shredded Newspaper: Pile of shredded newspaper used for Choice Study to test which pile natural vs. artificial does Max prefer in enrichment.

Relaxing

Relaxing: Max is laying down on the rock in rear area of the exhibit

Closed Eyes: Max has his eyes closed

Yawning: Max is yawning, which is a sign that he is tired

Chilling Rope: Hanging out on the rope, sitting up, but not swinging

Sitting Corner: Max is sitting in the far left hand corner of his exhibit

Sitting Rock: Max is sitting on the rock in the middle of the exhibit next to the little pool of water. Sitting on the Rock gives Max an opportunity to take a break from moving around the exhibit.

Laying on Stomach: Max is laying on his stomach on the rock in the middle of the exhibit next to the little pool of water. Lying on stomach, gives Max a comfortable position, which allows him to relax more comfortably.

Yawning: Max is yawning, which is a sign that he is tired

Interaction

Sitting/Door: Sitting at the door where the animal care specialists can talk and interact with Max
Playing with Jenny: Interacting with his sister.

Body Language

Hick Ups: Max has the hick ups which is forcing air into his lungs

Scratching Head: Max has used one of his hands to scratch his head to reach an itch that he has.